TITLE

Polytrimethylene Ether Esters

PRIORITY

This is a divisional of U.S. Patent Application No. 10/215,623, filed August 9, 2002, now US 6,608,168, which is incorporated herein by reference.

FIELD OF THE INVENTION

This invention relates to polytrimethylene ether esters, and their manufacture and use.

BACKGROUND OF THE INVENTION

Polytrimethylene ether glycol ("PO3G") and its use in thermoplastic elastomers, as well as in other applications, have been described in a number of patents and patent applications. PO3G can be prepared by dehydration of 1,3-propanediol or by ring opening polymerization of oxetane. PO3G can also be prepared from 1,3-propanediol, preferably as described in U.S. Published Patent Application Nos. 2002/7043 A1 and 2002/10374 A1, both of which are incorporated herein by reference.

Polyether ester elastomer comprising polytrimethylene ether ester soft segment and tetramethylene and trimethylene ester hard segments are described in U.S. Patent Application Nos. 10/016,195 and 10/016,023 (Attorney Docket Nos. CH-2767 and CH-2858) both of which are incorporated herein by reference. Polytrimethylene ether ester amides are described in U.S. Patent Application No. 10/073,745, filed February 11, 2002 (Attorney Docket No. CH-2816 CIP), which is incorporated herein by reference. Polyurethanes and polyurethane ureas are described in U.S. Patent Application No. 10/215,575, filed August 9, 2002 (Attorney Docket Nos. CH-2833), which is incorporated herein by reference.

While not wishing to be bound by theory, it is believed that, due to the incompatibility of the hard and the soft segments, phase separation occurs. The two phases constitute the elastomeric matrix. The hard segments form microdomains of crystallites, while the soft segments and a fraction of the crystallizable hard component that has not reached crystalline order form the amorphous phase. It is known to those skilled in the art that the better the distinction between the crystalline microdomain and the amorphous phases the better the elastic properties. Phase separation and microdomain formation in block polymers directly influence